PROJECT NUMBER: 1752
PROJECT TITLE: Optical Spectroscopy of Tobacco and Smoke
PROJECT LEADER: R. A. Fenner
PERIOD COVERED: November, 1985

I. Measurement of Smoke Components

A. Formaldehyde in Mainstream Smoke

A sampling system was developed for the analysis of formaldehyde in mainstream cigarette smoke by tuneable diode laser spectroscopy. Development of a quantitative puff-by-puff procedure for the system is currently in progress. Preliminary results for Monitor #23 cigarettes show a total cigarette delivery on the order of 12µg with 50% to 60% of the delivery resulting from the first puff.

B. Ammonia in Mainstream Smoke

The gaseous and total ammonia deliveries in mainstream smoke were determined for the following menthol brands: Kool 85, Salem 85, Newport 85, and Benson & Hedges 100. The results from these analyses are given in the following table.

Brand	% Soluble Ammonia	Mainstream Smoke	
		Gaseous[1] Ammonia, µg/cigt.	Total[2] Ammonia, µg/cigt.
Kool 85	0.13	0.9±0.2	7.1±1.2
Salem 85	0.18	1.4±0.3	8.7±1.2
Newport 85	0.14	2.1±0.3	17.6±2.4
Benson & Hedges 100 Menthol	0.29	2.6±0.2	18.6±1.8

[1]Tuneable diode laser method
[2]Trapping of whole smoke in aqueous medium with subsequent analysis by ion chromatography

The data show that Benson & Hedges 100's and Newport 85's deliver approximately twice as much gaseous and total ammonia as the Kool 85's and Salem 85's. It is also of interest to note that Newport 85's deliver more ammonia in mainstream smoke than would be expected based upon the percent soluble ammonia in the filler.

II. FT-IR Evolved Gas Analysis

The tobacco blends of the four menthol brands noted above were examined using the evolved gas analysis technique. The results suggested that the Salem blend may contain a higher percentage of burley or a different grade of burley relative to the Kool, Newport and Benson & Hedges blends.

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III. Memos

A. "Infrared Analysis of Sample #7619-98," R. A. Fenner to Dr. A. Kallianos, November 20, 1985.

B. "Data on Four Menthol Brands from the C.I. Division," M. E. Parrish to R. H. Cox, November 21, 1985.

C. "FT-IR Evolved Gas Analysis of Menthol Brands," R. A. Fenner to Dr. R. Cox, November 22, 1985.

D. "EGA Analysis of Menthol Crystals," J. L. Hart to Dr. R. Cox, November 26, 1985.

R. A. Fenner

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